

Air Emissions Dust Collection

Dust Collection

Date:

Company Name:

Facility Name:

Dust Collection Emissions - Particulate (PM 10)

Location/Name	Type: Cyclone Baghouse	Emission Rate (gr/cu ft) (A)	Fan Size CFM (cu ft/min) (B)	Hours of Operation per Year (C)	Emissions (lbs/year) (D)
Silo Vent	Baghouse	0.016	100	1000	13.71
Truck	Cyclone	0.055	2000	2000	1885.71
Total PM10 Emissions in Pounds/Year				Box X	1899.43
Total PM10 Emissions in Tons/Year				Box Y	0.95

Step 1 List the dust collection equipment, location, name and the type of dust collection device. Choose the type of dust collection equipment from the choices on the drop down menu. There are three choices, bag house, cyclone and blank. The blank is to correct errors. The typical emission rate will be listed as you choose baghouse or cyclone.

The emission rate, how dirty the air is as it leaves the control device, the Division typically uses 0.016 grains per cubic foot (gr/cf) for baghouse dust collection systems, if the manufacturers designed emissions rates are not known. For cyclone dust collection systems, use 0.055 gr/cf, if the manufacturers designed emissions rates are not known. Enter the number in Column A for each air pollution control device.

Note: Do not include dust emission estimates for equipment discharging to the inside of buildings for this calculation.

Step 2 Enter your air flow in cubic feet per min (cfm) in Column B. Refer to your manufacturer’s manual, name plate data or contact your vendor for this number. If you don't know your fan size, air flow thru the dust collector, use the last tab, Baghouse Size, to estimate air flow passing thru the equipment.

Step 4 Estimate the hours you operate your dust collector per year. You can do this on a monthly basis and then multiply by 12 for a yearly estimate. Enter number in Column C.

Step 5 The emission estimate, column D, is calculated by multiplying Column A by the cfm in Column B. Multiply that number by 60 to convert from minutes to hours. Multiply that number by the hours in Column C. Divide by 7000 to convert grains per year to pounds per year. $D=A \times B \times C \times 60 / 7000$, enter numbers in Column D.

Step 6 Add all the results in column D for a total in box X. Divide the total in X by 2000 to convert to tons per year, $Y=X/2000$, enter number in Box Y.

Air Emissions Wood Finisher Worksheet

Date: 1-00-00

Company Name: Test Company 3
 Facility Name: test 4

How to Estimate Fan Size

If you don't know the air flow thru the bag house, the following method will estimate the fan size, air flow rate in cubic feet per minute (cfm), using the surface area of the bags and assume a typical air to cloth ratio. The air to cloth ratio is the air volume per square foot of bag (cfm).

First calculate the filter area of the bag house in square feet by estimating the surface area of all the bags in the bag house:

Start by measuring the diameter and length of a bag. Next calculate the distance around the bag, Bag Circumference, using the bag diameter

$$\begin{aligned} \text{Bag Circumference} &= 3.1416 \text{ (times) Bag Diameter (inches)} \\ &= 3.1416 \times \frac{10}{\text{Bag Diameter}} = \frac{31.42}{\text{"A"}} \text{ Inches} \end{aligned}$$

Next determine the filter area of all the bags in the bag house:

Bag length in inches (times) bag circumference in inches, "A", (times) Number of Bags in Bag House (divide by) 144 square inches to square feet:

$$\frac{8.0}{\text{Length}} \times \frac{31.42}{\text{"A"}} \times \frac{200}{\text{Number of Bags}} / 144 = \frac{349.07}{\text{"B"}} \text{ sq feet}$$

Now using the above filter area and a typical air to cloth ratio the flow rate thru the bag house can be estimated.

Determine which bag cleaning method you have in your bag house, each cleaning method has a typical air to cloth ratio : shaker cleaning = 3 cfm/sq ft
 pulse jet cleaning = 7 cfm/sq ft

Flow Rate = Bag filter area (times) exhaust ratio for the bag house cleaning system.

$$= \frac{349.07}{\text{"B"}} \times \frac{3}{\text{3 or 7 cfm/sq ft}} = \frac{1047}{\text{"C"}} \text{ CFM}$$

Note: There are many ways to estimate flow rates thru ventilation systems, this is one method, you may use any logical method. Please include the calculation method you use with the information you are submitting.